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ABSTRACT

The speech of a 2-year-old monolingual Estonian child was studied over a period of six months. The child's initial and medial consonants and clusters were examined and charted to highlight her difficulties. Stops and nasals were easier than fricatives and sonorants; by 1 year 7 months the labials were essentially mastered; fricatives were more difficult, and the /r/ sound had not been achieved at all. Final consonants were also studied, as were vowels and clusters. Vowels /i/, /a/, /u/ were simpler, but /e/ and /o/ harder to say, both in stressed and unstressed use. The phonological processes were examined to determine what organizing principle is at work in sound selection. Syntactic and morphological analysis allowed classification and quantification of words in the child's lexicon, with common nouns by far the most numerous. The total lexicon is appended to the report. (CK)

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ON THE ACQUISITION OF ESTONIAN

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INTRODUCTION

The present paper is intended only as a preliminary report on field work still in progress with a monolingual Estonian child, now nearly two years old. The data to be discussed here were collected in seventeen two-hour sessions over a period of six months, with bi-weekly visits in the first month, one a week in the second, and visits every two or three weeks thereafter. Data from the last three sessions will be referred to only informally, as they have not yet been fully processed. At the time of the first session the child's mean utterance length was approximately one word -- and one morpheme. By the end of her twentieth month (the ninth session) the average was 1.18; at the most recent session it was 2.18 -- counting, in these latter cases, not morphemes but words: The number of morphemes would be considerably higher and, for cross-linguistic comparison, possibly misleading, due to the rapid development of inflection for tense in the verb and for case and number in the noun (see Morphology, below).

Though Linda V_____ was born in the United States (San Mateo, California, on January 5, 1970) and is growing up here, her daily life includes relatively little contact with English speakers. Her mother, Hille, left her native Estonia in 1944 at the age of five. She was raised in Sweden, completing high school there, but receiving little or no formal training in Estonian (which she nevertheless reads and writes). She moved to California with her parents in 1958. Linda's father, Mati, also left Estonia in 1944, at eleven, for Germany; in 1949 he and his mother immigrated to the United States, where he completed high school and some years of college. Mati's mother lives in a cottage adjoining their home. Hille's parents also live nearby and frequently baby-sit. In addition, most of the family friends are Estonian-speaking. Hille and Mati use Estonian exclusively in addressing Linda, even when non-Estonian speakers are present. Attending a public nursery school or playroom on one occasion with her mother at 1;10, Linda used a whispered mumble as a replica of the English she heard from the other children. Lately she has asked her mother to talk "mumumumum", responding with a laugh and demands for more when her mother speaks a little English for her. Out of the 300 or so words recorded in our field sessions only six English words occur: Two are culture-loans -- /kǽtsup./ 'ketchup' and /tì·ví:/ 'television' (the former is a food item not used in Estonia, the latter is referred to there as /tèlevíːsor/ 'television set' and /tèlevisjóːn/ 'television medium'); one is the near-universal /ok·éi:/ 'okay'; and three are direct reflections of the fact that Linda lives in an English-speaking community: /hai:/ 'hi!', /pai:/ 'bye!', and /nɔ̀u-nóu:/ 'no-no!', the latter reserved exclusively for reprimands to Muki, the family's Labrador, who is otherwise always addressed in Estonian.

PHONOLOGY

The description that follows is based entirely on substitution analysis, comparison of the child's forms, gathered over the months of most intense development vis-à-vis acquisition of the adult inventory of segments,[1] with the adult model. Detailed or "fine" phonetic transcription was not attempted,[2] but ample data are available on the question of approximation to the adult phonemic inventory and canonic requirements.

Adult forms will be cited here -- using slant brackets to distinguish the model from the child's replica, in square brackets -- more or less in the traditional phonemic transcription, reflecting a relatively shallow analysis sufficient for rendering the broad phonetic shape of the words the child hears. The consonant inventory --

p	t	t'		k
(f)	s	s'	(š)	h
m	n	n'		
	l	l'		
	r			
v		j		

-- includes a series of palatal consonants (C') at least partially predictable at the morphophonemic level and phonetically recognizable as palatal not in the release but in the quality of the preceding vowel. Palatalization is used to a greater extent than usual in language addressed to the child, particularly in a coaxing or consoling function, but this phenomenon will not receive special attention here. The consonants /f/ and /š/ are rare, occurring mainly in relatively recent loan words. An assimilation rule produces [ŋ] for /n/ before velar stops, except before a morpheme boundary (hence, /rón:ki/ 'train, sP' → [róŋ:ki], but /ón:+ki/ 'is indeed' → [ón:ki]).[3] The velar nasal will not be used here. The vowels include a front rounded pair, a single back unrounded mid-vowel /õ/ (= [ɤ]), and a low front vowel /ä/ (= [æ]) in addition to the standard five vowels typically found in European languages:

i	ü		u
e	ö	õ	o
ä		a	

Primary stress falls on the initial syllable of native Estonian words, but may fall elsewhere on loan words (often in combination with a long syllable nucleus). Both primary and secondary stress (which is not predictable in

any simple terms) will be marked, except on monosyllables.

The question of Estonian quantity is complex and, partly because the presence of three phonologically distinctive degrees of length has offended theorists with a penchant for binariness, has been the subject of many studies for over fifty years. I will use a three-way marking of both vowels and consonants in stressed syllables.

I	a	or	t	: short segment
II	a'	or	t'	: long segment
III	a:	or	t:	: over-long segment

It has been shown that in words of the structure #CVCV# the length of the vowel of the second syllable is inversely proportional to the length of the vowel of the first syllable (cf. Posti 1950, 1968; Lehiste 1960, 1966; Liiv 1961, 1962). The three-way length contrast can in fact be defined in syllabic as well as segmental terms, but the segmental and syllabic boundaries do not necessarily coincide. It has been suggested that the third degree of length be handled as a prosodic (syllabic) phenomenon, while the first and second degree are viewed as segmental (E. Vihman 1972): Though the marking of segmental length is unambiguous where a single vowel or consonant is involved (/kálu/ 'fish, pP', /ká·lu/ 'weight, sG', /ká:lu/ 'weight, sP'; /kátus/ 'become lost, s3pret.', /kát·us/ 'roof', /kát:us/ 'become covered, s3pret.'), it becomes a problem in transcribing a form like /kó:k·i/ (or /kó·k:i/ or /kó:k:i/) 'cake, sP', in which segmental assignment of the extra-length remains arbitrary, even after careful instrumental measurement, though both the intonation pattern and the first vs. second syllable length ratio clearly indicate that the form as a whole is over-long. Similarly, where the syllable nucleus is complex (i.e., contains a vowel + continuant sequence) only the short and long segmental degrees are possible, though the syllable as a whole is either long (contains two short segments) or overlong (contains a long post-vocalic segment): /káela, káe:la/ 'neck, sG, sP', /kármi, kár:mi/ 'severe, sG, sP', /kás't'i, kás':t'i/ 'large box, sG, sP'. Since the treatment of the Estonian quantitative contrasts in either segmental or syllabic terms so far lacks the support of a convincing morphophonemic analysis, I have here adopted the traditional segmental transcription.

Throughout the discussion of Linda's phonology I will be systematically using data from the first four months alone, summarized into four "stages" in her developing grammar, Linda's language at 1;7, 1;8, etc.

Consonants and clusters

All the consonants except the palatal series may occur word-initially in adult Estonian. The clusters /pl, pr, kl, kr/, found initially in the adult form of just ten items in Linda's vocabulary, constitute, with /tr/, the only initial clusters occurring with any notable frequency in the adult language (cf. Raun & Saareste 1965:13). Post-vocalically the short obstruents give a near voiced impression to the ear accustomed to English, while their long or overlong counterparts are clearly voiceless, and are always released finally.

The results of a substitution analysis of Linda's initial and medial consonants and clusters are given in Figure 1.[4]

Figure 1

Initial and medial consonants

Total = number of different words represented, over four month period. Repetitions of same word counted only in case of variant rendering (X/Y).
Model = adult phone

Total	Model	1;7	1;8	1;9	1;10
28	#p	p 15 b 1	p 13 Ø 1	p 14	p 18 p/v 2
4	#b	b 1 p 1	b 2 p 2	b 3 b/p 1	p 1
3	#pl	p 1 t 1	p 1	p 1 k 1	p 1
2	#pr		p 1		p 1
11	V p V	p 3 p· 1 p/p· 3	p 5 p/p· 1	p 6	p 5
5	V p· V	p· 1 p·/p 1	p· 5 p·/p 1	p· 4	p· 2
2	V pl V		p 2	pl 1 p 1	
1	V pr V	p 1 p/b 1	p 1 p/b 1	p· 1	
1	V pt V		p· 1		
23	#t	t 12 p/v 1 k 1 t/d 2 t/Ø 1	t 14 d 1 t/b 1	t 15	t 14
9	V t V	t 3	t 6	t 5	t 6 t· 1

Total	Model	1;7	1;8	1;9	1;10
16	V t· V	t 8	t· 6 t 1 s 1 t·/t	t· 9 t 1 s 1 t·/t 2	t· 9 s 1 t·/t 1
1	V tj V	j 1	j 1	j 1	j 1
2	V tk V		jk· 1	jk· 1	tk 1 jk· 1
5	V ts V	ts 2 s· 1 ts/s· 1	ts 3 ts/s· 1	ts 3 s· 1 ts/s· 1	ts 2 s 1 ts/s· 1
54	#k	k 19 k/p 2 k/t 1 k/g 3 k/h/j/Ø 1 k/Ø 1	k 31 k/g 1	k 31	k 30
2	#kl	k 1 k/Ø 1	k 1	k 2	
3	#kr	k 1	k 1	k 1	k 1
1	V k V		k 1		
15	V k· V	k· 9	k· 10	k· 9	k· 12
2	V ks V	ts 1	ts 2	ks 1? ks/s· 1	ts 1
16	#s	s 1 p i t 1 k/g/Ø 1 l 1 Ø 1 s/Ø 1	t 1 k 1 n/l 1 Ø 1 Ø/j 1 m/n 1	s 5 t 1 k 1 n 1	s 8 t 1 k 1 l 1 j 1
1	#šl		v 1		
13	V s V	s 1 s· 5	s 1 s· 5 š 1	s 4 s· 6	s 2 s· 5
1	V s· V	s· 1	s· 1	s· 1	s· 1
5	V st V	s·/sts/st ʔh/t·/h·/ht 1 ts 1 ts/s/s· 1	st 4 st/ts/s· 1 s'/hs 1 st/s/s·'1	st 3 st/s/s· 1	st 1 s/s· 1

Total	Model	1;7	1;8	1;9	1;10
1	V sk V				sk 1
11	#h	h 3 Ø 2 j 1 h/Ø 1	h 2 Ø 2 j 1 h/Ø 1	Ø 5 j 1	h 2 j 1 h/Ø 1
11	V h V	h 8	h 7	h 7	h 7
5	V ht V	ht 1 ʔht 1 t· 1	ht 1 s' 1	ht 2	ht 1
1	V hk V				k· 1
1	V hl V			h· 1	
3	V hv V		f 1	f· 2	v· 1 f· 1
20	#v	v 7 w 1	v 9 w 1	v 9 w 1 p 1	v 10 w 1 v/w 1 v/p 1
4	V v V	v 1 v/b 1	v 1	v 1 p 1	v 2 n/jt/j/Ø 1
20	#m	m 6 p 1 n 1	m 13	m 10	m 13
5	V m V	m 1	m 3	m 1	m 3
3	V m· V	m· 1		m· 1	m· 2
2	V mp V	mp 1 p· 1	mp 1	mp 1	
1	V mp· V	p 1	mp· 1	mp· 1 mp· /p·/m· 1	mp 1
2	V mps V	mps 2		mps 2	
14	#n	n 7 n/m 1	n 8 m 1	n 8 m 1 n/t 1	n 9
12	V n V	n 3 n· 1 n/n· 1 n/m 1	n 5 n/j 1	n 6 j 2	n 6 j 2
5	V n· V	n· 5 n·/n 1	n· 3	n· 2	n· 1
2	V nt V	nt/nt· 2	nt/nt· 2	nt 2	nt 1
1	V nt· V	nt 1			

Total	Model	1;7	1;8	1;9	1;10
1	V nts V	nts 1	nts 1	nts 1	nts 1
8	V nk V	nk 1	nk 1 nt 1	nk 3 1	nk 4 1 n· 1
2	V nk· V	nk· 1 k· 1	k· 1	k· 1	k· 1
19	#1	l 2 m 1 n 1 n/Ø 2 j 1 Ø 2 l/m 1 l/m/n 1	l 4 m 1 n 3 v 2 j 1 l/n 1	l 8 m 1 n 1 n/j 1 j 2 w 1 l/n 1 l/j 3	l 5 n 2 v 2 j 2
10	V l V	l 3 j 1 l/t 1	l 5 Ø 1	l 4 l/Ø 1	l 5
9	V l· V	l· 3 l 1 j 1	l· 3 t 1 j 1	l· 4	l· 6
1	V lt V				lt 1
3	V lk V			lk 1	lk 3
1	V lm V				l· 1
9	#r	Ø 2	Ø 2 j 1	Ø 2 j 3 n 3	Ø 1 j 1 n 1
10	V r V	l 2 Ø 1 j 1	l 1 l· 2 h 1 Ø 1	l 3 Ø 1 j 1 l· 1 l/j 1	l 2 l· 1 j 1 Ø 1 l/j 1
2	V rt V			;k 1	t 1
2	V rk· V	jk· 1		jk· 1	k· 1
1	V rst V			st 1	st 1
1	V rn V				l· 1
1	V rv V		w/p/l^s 1	l^h/t^s 1	l· 1
1	V rj V	l· 1	l· 1	l· 1	l· 1
16	#j	j 1 k 2 Ø 1 j/Ø 2 j/Ø/t 1	j 6 k 1 j/Ø 1	j 6 k 1 s 1 l/Ø 1	j 8 j/l 1
2	V j V	j 1	j 2	j 1	

Disregarding the few forms (loan words) with initial /b/, which may or may not be devoiced initially by adult speakers here (though in Estonia they are generally devoiced), the following table summarizes the data on initial consonants: The entry + signifies "over 80% correct", = signifies over 50% correct, - indicates some correct forms, though less than 50% , and blank means no correct forms.

	1;7	1;8	1;9	1;10
# p	+	+	+	+
# t	=	+	+	+
# k	=	+	+	+
# s	-		=	=
# h	-	-		=
# v	+	+	+	+
# m	=	+	+	+
# n	+	+	+	+
# l	-	-	-	-
# r				
# j	-	=	=	+

Table 1

This summary highlights the child's difficultis: (1) Stops and nasals present less of a problem than do fricatives and sonorants which do not include a stop articulation -- because the articulatory adjustment required is less fine? All nasals and stops are essentially mastered by 1;8. (2) At 1;7 /v/ has already been mastered, as well as /p/ and /n/ (and /m/ is close to the cut-off point, with 75% correct forms). Aside from the fact that labials may be easier to replicate correctly because of the visual cue, the articulation of /v/, unlike that of /s/, requires no delicate adjustment in tongue position. (3) Except for /v/, the fricatives are difficult and are only gradually being mastered at 1;10. /s/ is of course the only Estonian fricative requiring the typically fricative tongue/palate adjustment. While it is higher in frequency than /h/ initially, it is also clearly more of a problem for Linda, and it shows a much larger range of error than /h/, which alternates only with ∅ -- as indeed it may in the standard adult language as well -- and with /j/, before a front vowel only. (4) Whereas /l/ remains a step more difficult than /s/ and /h/ by the end of the four months, the semi-vowel /j/ shows steady progress.

to relatively complete mastery by the end of the period covered. (5) Even now, at 1;12, Linda has not once produced a trill /r/ (nor indeed an /r/ of any other kind!), in any position.

The clusters /pl, pr, kl, kr/ occur in few forms initially, but their treatment in Linda's grammar nevertheless falls into a clear and consistent pattern: The cluster is regularly simplified in the direction of the stop. In view of the relative difficulty of initial stop vs. initial /l/ or /r/, this is quite unsurprising, but it is interesting that where, in older Germanic, Baltic, and Slavic loans into Estonian, the cluster was simplified to fit the demands of the native canon, it was always the last consonant in the cluster that was retained: cf. /ran:t/ 'shore': German Strand; /túpa/ 'room': Lithuanian stubà; /rá·mat·/ 'book': Russian gramota reading and writing, etc. (This tendency continues today in Finnish, but ceased operating some time ago in Estonian. Compare Finnish rouva, Estonian /próua/: German Frau 'lady, Mrs.'; Finnish laasi, Estonian /kla:s'/: German Glas 'glass'; etc. We could expect Linda's version of these words to be *[póua] and *[ka:s'].)

Medially, setting aside the quantity distinction for later consideration together with quantity in vowels, all consonants were essentially mastered from the outset of this investigation, with the exception of /l/, which was stabilized at 1;8, and /r/, which has yet to emerge.[5]

With regard to medial clusters, though no one cluster occurs commonly enough to admit a percentual evaluation of Linda's substitutions, it is again clear that stop and nasal articulations are relatively less difficult. The only clusters for which some correct substitutions were made already at 1;7 are all the nasal + consonant(s) combinations and /ts/ and /ht/; by 1;10 one occurrence each of /tk/ and /sk/ could be noted. (The use of [f] for /hv/ may be counted "correct", since in adult Estonian the two realizations vary freely.) Of the stop + sonorant clusters, only one correct replica, [pl], occurring at 1;9, may be counted. The remaining instances again show simplification in the direction of the stop. The sequence sonorant + stop appears to present less of a problem, both /lt/ and /lk/ being essentially mastered by 1;10. Clusters involving /r/ + stop are replaced by [l], [j], or Ø + stop; /rj/ yields a so far stable [l·], while /rv/ poses a particular (perceptual?) problem: Linda frequently rehearses the word /várvas/ 'toe', but has so far been unable to reproduce any near approximation of the adult sequence.

The data regarding word-final consonants, rare in mono-morphemic Estonian words but quite common as inflectional markers, are presented in Figure II, divided into the categories "after stressed vowel" (monosyllabic) and "after unstressed vowel" (polysyllabic words).

Figure II

Final consonants and clusters

+ = morpheme boundary precedes consonant

Total	Model	1;7	1;8	1;9	1;10
A. After stressed vowel					
4	+ p			Ø 2	Ø 2
1	p·		p· 1		
7	t·	t· 1 Ø 2 k 1	t· 3 t 2 t·/ts 1	t· 1 k 1 t 1	t· 1
2	ts	ts 2 ts/nts 1	ts 2 ts/nts 1 ts/t^h 1	ts 2 ts/t 1	ts 1 ts/s' 1
1	k		ts 1		
4	k·	k· 2 t· 2	k· 3 k·/t· 1	k 2	k· 1
4	ks	ks 1 k^h 1	ks 3	ks 4 k$\breve{s}$ 1	ks 1
5	s	s 2	s' 1	s 1	s 2
4	s·	s· 3 s·/f· 1	s· 3 s·/f· 1	s· 1	s· 1
2	m	m 1	n 1	m 1	
1	mp	mp 1	mp 1		mp 1
6	n	n 3	n 1 Ø 1	n 1 n/Ø/m 1	n 2
2	nt	nt 1	nt 1	nt 2	nt 1
3	nt·		nt· 1	nt· 1 n· 1	
2	l	Ø 2 l/Ø 1	4 2 l/Ø 1	l 1	l 1
5	l·	l· 4	l· 4	l· 1	
1	lk		lk 1		
2	lm	m· 1	lm 1 m· 1	lm 1	m· 1

Total	Model	1;7	1;8	1;9	1;10
3	r	Ø 1	Ø 1 l l + 1		Ø 2
1	rt	p/t 1	t 1		t^s 1
1	rk			k/nk 1	
1	rn			n· 1	
1	rv	+ 1	+ 1		l 1

B. After unstressed vowel

1	p			Ø 1	
9	+ p	Ø 3	Ø 5	Ø 4	Ø 4
9	+ t	t 1 Ø 1	Ø 3	Ø 3	t 1 t/Ø 1
1	t·		t· 1		Ø 1
1	+ t·	Ø 1	Ø 1	t/t^s/Ø 1	Ø 1
1	lt			Ø 1	
7	s	Ø 2	s 1 s/Ø 1 Ø 2	s 3 Ø 2	s 2 Ø 1
3	+ s		s 2	s 1	s 2
2	v	v 2	Ø 2	Ø 1	Ø 1
1	n	n 1	n 1		
2	l	Ø 1	Ø 1	Ø 1	
4	r	Ø 1	Ø 1	Ø 1	Ø 1

Of the short obstruents, /p, t, s/ occur in high-frequency morphemes, marking the third-person singular present tense of the verb (/p/), the nominative plural of the noun (/t/), and the third person singular preterite of the verb and the "inessive" or "in"-case of the noun (both /s/). The only one of these consonants which also occurs with any frequency in mono-morphemic words is /s/ (i.e., on some nouns in the nominative singular, which is unmarked), and it was also the first short obstruent to occur in Linda's speech word-finally -- beginning at 1;8. The preterite inflection was established by 1;9, the plural inflection was used

regularly by 1;10, the /p/ of present tense inflection remained still unknown at 1;10, but was suddenly in heavy use late in 1;11. /v/ is relatively rare word-finally, except as the present participle marker (occurring, e.g., in /pálav/ 'hot', lit. /pála+v/ 'burn+ing'); Linda has not yet used it. Long final obstruents are noticeably more common in Linda's speech, a few cases of /t·, k·, s·/ occurring correctly from 1;7 on, alongside the final clusters /ts/ and /ks/, in monosyllables. I would submit that perceptual salience alone accounts for the relative orders of acquisition of long and short consonants finally, the former being rather fortis and thus more prominent. Note that /t·/ occurs as one of the partitive singular markers; it began to come into use as such at 1;10 (see Morphology, below).

Some final nasals and nasal + stop clusters occur from 1;7 on, especially in monosyllables, and there are almost no errors in the few recorded occurrences of words with final nasal; similarly final long /l·/ occurs in monosyllables from 1;7 on, while short /l/ is correctly replicated by 1;9, and substitutes for (apparently perceived but not reproducible) /r/ by 1;8. In polysyllables both /l/ and /r/ are consistently omitted finally.

Vowels and clusters

The distinction between (stressed) vowels that are relatively "hard" for Linda and those that are relatively "easy" is quite clear-cut: see Figure III. The vowels /i, a, u/ had definitely already been mastered by 1;7; /e/ and /o/ show a tendency to be confused with the corresponding higher vowels /i/ and /u/, respectively, /e/ somewhat more so than /o/. The front vowel /ä/ is confused with the corresponding central vowel /a/ -- and in fact rather unaccountably shows some regression over the four months. The theoretically satisfying preference Linda shows for the three "least-marked" vowels /i, a, u/ is seconded in her distinction between the highly-marked vowels /ü, ö, õ/, in which front-backness and rounding do not agree, and all the other vowels -- though indeed /õ/ (mid back unrounded) is established at about the same rate as /ä/. [ä] varies only with [a], however, while /õ/ is confused about equally often with [u] and [i]. The two front rounded vowels are clearly of another order of difficulty entirely. /ü/ has not yet been mastered, and in fact is realized as [ü] only sporadically. Linda's words with [u] for /ü/ -- e.g., [túhi] for /tühi/ 'empty', [mut·s] for /müt':s'/ 'hat', [kum:] for /kül':m/ 'cold' (all from 1;7 on), [júp:a] for /hüp:a/ 'jump, s2 imper.' (1;8 on), [túja] (1;7, 1;8), [túl:a] (1;9, 1;10) for /sül:e/ 'into [mother's] lap, arms' -- seem to be fairly stable over the four months, whereas the forms with [i] vary: [ik:š, ük:s] (1;9) for /ük:s/ 'one' (cf. also [üksi], 1;10, for /üksi/ 'alone'), [püt'si] (1;7), [bütsi, pús·it] (1;8), [piksi] (1;9),

Figure III

Stressed vowels and clusters

Total	Model	1;7	1;8	1;9	1;10
28	i	i 14	i 16 e· 1	1 15	i 18 i· 2 i/a 1
14	i·	i· 4 i 1 i·/i 2	i· 3 i 2 i·/i 1	i· 8 i 1 e· 2	i· 7 i 2
16	e	i 2 Ø 1 i· 1	i 5 e/i 1 e·/i· 1	e 3 i 2 i·1	e 4 i 3 i·1 e/i 1
8	e·	e· 2 i· 2	e· 2 e·/i· 1 i 1	e· 4	e· 3 e·/i· 1
6	ei		ei 1 1 1 i 1 i/e· 1	ei 1 i 1	ei 2 e· 1
1	ea	ja 1		oa/wa 1	
9	ä	ä 2 a 2	ä 2 a 2 i 1	ä 1 a 5	ä 1 a 2
4	ä·	ä 1	a· 1 a/ä 1	ä 1	ä· 1 ä 1
2	äi		äi 1		äi 1 äi/i 1
2	äe			äe 1 a· 1	äe 1
69	a	a 38 ä 2 a/ä 1	a 38	a 41	a 36
9	a·#	a· 5 a 2	a· 4 a/a· 2 a 1	a· 4 a 1	a· 5 a 1

Total	Model	1;7	1;8	1;9	1;10
9	ai	ai 4	ai 4	ai 6 a 1	ai 4 a 1
1	ae			a/õ/u 1	ae 1
5	au	au 1 au/a 2	au 1 a 1 au/a 1	au 2 a 1 au/a 1	au 1
39	u	u 16 u/o 1 u/ə 1	u 20 u/o 1	u 18 u/o 1 u· 1	u 18
12	u·	u· 4 u·/u/o 1 o 1	u· 3 u 1 ʉ 1	u· 3	u· 7
26	o	o 7 u 3 o/a 1 o/u 1	o 12 u 2 o/u 1	o 9 u 3 u/õ 1 o/u 3	o 9 u 2 o/u 4
17	o·	o· 2 u·/o· 2 o·/u 1 u·/u 1	o· 3 u·/o· 1 u· 1 u 1 o 1	o· 6 u· 2 o·/u· 1 o 1	o· 8
1	oi	os'/uj 1	os' 1		
8	ʉ	ʉ 1 i 1 u 3	u 5 i 1	u 4 u· 1 ʉ/i 1 i 1	ʉ 1 u 5 ʉ/i 1
1	ʉ·		i· 1		
2	ʊ·		u 1	a 1	u 1
10	õ	õ 4 u 1 i 1	õ 2 õ/i 1	õ 2 õ/u 1 i 1 u 1	õ 2 u 3 o 1
1	õi	a· 1	a· 1		
1	õu	ou 1	ou/o/o· 1		

[vitsɪ, pʊ̈tsit] (1;10) for /pʊ̈ksit/ 'pants'. /ʊ̈/ ranks with the trill /r/, in that Linda had not yet used it once as of 1;11 (but she achieved a very close, somewhat high or [ʊ̈]-like approximation in several uses of the word /sʊ̈:p/ 'eat', s3pres.' at 1;12). This vowel is of significantly lower occurrence than any of the other vowels, or than /r/, in the adult lexicon as well as in Linda's. Since 1;10 two new words with /ʊ̈/, or rather /ʊ̈'/ and /ʊ̈:/, have been added, /kʊ̈'kis/ 'in the kitchen' and /tʊ̈:t'ap/ 'work, s3pres.', in both of which Linda substitutes long [i] for /ʊ̈/. (The only common adult forms with short /ʊ̈/ are /kʊ̈ha/ 'cough', and its derivatives; Linda has not yet used any of these, to my knowledge.) Rather than attempt to replicate /sʊ̈:/ 'eat', Linda invented the term [nämʲämʲ:(i)] as one of her earliest "words". The form [su] for /sʊ̈:(p)/ first occurred at 1;10; the only other occurrences of /ʊ̈:/ within the four months covered in Figure III are both renderings of /nʊ̈:p'/ 'button', which it cost some effort to elicit during field sessions, though Linda clearly understood the word and could identify the object referred to.

This kind of observation leads me to speculate as to the role played by phonetic difficulty, whether perceptual or articulatory (or both), in the child's choice of (active) vocabulary, i.e., of words to attempt using. Is there a good correlation between the frequency of words containing a given phone in Linda's vocabulary and its frequency in the adult Estonian that she has been exposed to? Or does she try to avoid using, say, words with initial /r/, or with the vowel /ʊ̈/? Could a total difficulty quotient be calculated from the relative difficulty of the various consonants and vowels in a word, in their respective positions, and then used to try to predict the relative time of acquisition of, say, high frequency nouns and verbs ('eat' and 'button', for example)?

Vowel clusters are represented by too few forms in the data to allow of much comment, but it may be noted that /ai/ appears to pose no special problem, while /ei/ has taken Linda longer to master -- as follows from the fact that /e/ itself begins to come under good control only in the latter part of the period investigated; possibly it is also difficult to distinguish the two separate segments in /ei/, i.e., to differentiate the cluster from /e'/, since they are perceptually as well as articulatorily very close. The cluster /õi/ is rendered as [a:] in the common lexical item /või'/ 'butter' (1;7 on: [va:]); Linda's mother reports that by 1;12 she was varying [või:] with [va']. It also occurs in the past tense of some common verbs: /jõi:/ 'drank', /sõi:/ 'ate', /tõi:/ 'brought', /lõi:/ 'hit', the first three of which Linda now uses in the present tense but none of which she has attempted to use in their "strong" or irregular past tense form; she has formed a regularized past tense for 'drink' [ju:s], based on the marker /s/ which occurs on the vast majority of verbs.

The unstressed vowels (see Figure IV) show no startling difference from stressed vowels in control of quality. The adult language allows only /i, u, a, e/ in unstressed syllable, except for a scattering of loan words and proper names with /o/. Both /e/ and /o/ give Linda trouble, as they do under stress, the preferred substitutes again being [i] and [u], respectively, with [u] for /e/ in the one instance where /v/ precedes: /káh:vel/ 'fork' → [káf:u].

Figure IV

Unstressed vowels

A. Disyllabic forms

Total	Model	1;7	1;8	1;9	1;10
68	i	ɪ 32 u 1 i/u 1	i 34 u 1 Ø/a 1 Ø 1	i 38 Ø 1	i 36 u 1
35	u	u 18 u/o 1	u 19	u 19 u/a 1	u 20 i 1
67	a	a 25 u 1	a 34 Ø 1 u 1	a 37	a 41 Ø/i 1
4	o	o/u 2	u 1 o/u 2	u 3	u 2 o 1
26	e	e 1 a 5 i 3 e/i 1	e 2 a 1 i 4 e/i 1 Ø 1	i 5 a 2 e/i 2 u 1	e 2 i 7 a 2 e/i 1

B. Tri-and quadri-syllabic forms

	Model	1;7	1;8	1;9	1;10
i	áprik·ð:s éhit·àp káe:lk·ìrjak·	ápik·ù	ápik·ù	ápik·ù:s éhɨt·à káljak·àm / káelk·i kɔ̃unǫ / kújǫ	
	kóp·ik·às		kóp·i	kóp·i	
	lápitàs	páti			
	líplik·às		vé·pik·às	líplik·às	
	lúsɨk·às			lú·sik·ì	lúsik·à
	méril ìn		míl·i	míl·i	míl·i
	mó·nik·à				mó:ni
	mú·sik·à	mú·sí	músik·à	mú·sik·à	
	sínɨnè			níni	síni

	Model	1;7	1;8	1;9	1;10
u	hópunè		(h)ópu	hópu	hópu
	kírjut·àp	kil·a	kíl·a	kíl·a	kíl·a
	nú·sut·à				nú·su
a	étas'ì			étasì	
	kánkarù			kárʒu	kárʒu
	kól·anè		kóta	kól·a	kól·a
	pát·arèi		pát·i		
	púnanè			púna	
	vánaèma/ìsa		vája	wája	vája
o	ák·ropàt'·				át·up·ak·
e	áp·els'ìn			áp·isì	
	róhel'ìne			núhi	

One recurrent source of error in unstressed vowels is an apparent tendency toward assimilation to the stressed vowel: cf. [júhu/júh:u] (1;7), [júhu] (1;8) for /júhip/ 'drive, s3pres.'; [kúki/kúk·u] (1;7) for /kó:k·i/ 'cake, sP'; [lúsik·ì] (1;9) for /lúsik·às/ 'spoon'; [múnu] (1;7 - 1;8) for /múna/ 'egg'. The form [páha] (1;7) for /pá̋he/ 'onto the head' might also be adduced, though the presence of numerous other [a] for /e/ substitutions in which no such assimilation can be claimed (at 1;7, [túja] for both /sű̋l:e/ 'into [mother's] lap, arms' and /túle/ 'come, s2imper.', [tí:a] for /tére/ 'hi, greetings', and [úja, úl'a] for /ú·et/ 'new, pN') makes that example less persuasive. It should be noted further that in at least one case Linda has created a noun by adding [a], by far the most commonly occurring unstressed vowel, to the sound she hears conventionally associated with the animal named: [pr:(u)a] 'horse', the consonantal sequence here rather inadequately representing a labial trill,[6] which is used by Estonian farmers for 'whoa!', and which Linda has heard in a nursery song (compare her creation with the baby-talk terms /mú·a/ 'moo-cow' and /áua/ 'bow-wow', both formed by adding /a/ to the sound conventionally associated with the animal -- /mu:/ and /àu·-ãu:/.

Another error common among the few incorrect disyllabic forms is omission of the unstressed syllable entirely: cf. [ne:, ni:] (1;8) for /néli/ 'four' (since 1;8 Linda has omitted this number -- because she considers it phonetically troublesome? -- and counts [kak:s # kol:m # vi:s] 'two, three, five'); [kúp:] (1;9) for /krúvi/ 'screw'; [vau:, va+:] (1;8), [val:, vál·it] (1;9) for /várvas, vár: pat/ 'toe, toes'; [am:, au:, ónu] (1;7) for /ónu/ 'uncle'; [kip:s, kif:] (1;8) for /kárpes/ 'fly'. (In the

latter two cases the collapse of the second syllable has involved change in the quality of the first vowel as well.)

A total of 23 words of more than two syllables occur in Linda's corpus (cf. Figure IVb). Judging which syllable has been retained by the quality of the vowel (with [u, i] for /o, e/ in [át·up·ak·] (1;10) for /ák·ropà:t·/ 'acrobat', [ap·is·i] (1;9) for /áp·elsìn/ 'orange'). I summarize the degree of Linda's fidelity to the syllable structure of the model below:

	1;7	1;8	1;9	1;10
No syllables omitted	1	3	7	2
Last syllable(s) omitted	2	4	7	7
Second syllable omitted	1	3	3	3
First two syllables omitted		1	1	

Table 2

I have not included words reaching three or more syllables only when bi-morphemic, such as /áut·o+kà/ 'with [the] car', since they clearly do not present the same problem to the child as an unanalyzable three or four-syllable-long stretch. Compounds are a special case. I have treated as bi-morphemic only those compounds in which at least one member was a part of Linda's lexicon before she attempted the longer word -- namely, /já·na+lîn:t/ '? +bird = ostrich', /kúk·er+pàl':/ '? + ball = somersault', and /ðhu+pàl':/ 'air + ball = balloon', in none of which the first member was familiar -- but then that is also true, for the child, of all adjective + noun combinations, for example, unless she is already familiar with the adjective in its predicate function (Linda had still only used two adnominal adjectives by 1;10, /váik·e/ 'small' as of 1;8, /su:r/ 'large' as of 1;9). The compound /káe:l+kìrjak·/ 'giraffe, lit. neck + spotty' was rendered in various anomalous ways (1;9), until Linda finally arrived at [káelk·i] (1;10), and /vána+èma/ or /vána+ìsa/ 'grand-mother or -father, lit. old + mother, father', were both rendered [vája] from 1;10 until the most recent session (1;12). For Linda, the first form clearly counts as a long unanalyzable word, since neither of the components occur in her vocabulary. Similarly, since she uses [ma:] for /éma/ for 'mother', as does her mother as well now, and [tá·ta] 'daddy' for /ísa/ 'father', both components of /vána+èma/ and and /vána+ìsa/ are also presumably unfamiliar except in those two words themselves.

The only forms with truncation of the first, stressed syllable were /élevànt': / 'elephant' and /hélik·ðp:ter/ 'helicopter'. In both cases the third syllable, that receiving secondary stress, was treated as word-initial -- [van:] and [kup·i]. The fact that Estonian has initial stress certainly explains why that syllable is most rarely dropped. Note that the collocation /ej táha/ '[I] don't want' a common adult response, without person marker, to questions of the sort "Do you want to . . . ", with the person understood was rendered simply [taha] (which could in theory also represent /táhap/ 'want, s3pres. (affirmative)' or /táha/ 'want, s2imper. '), with negative meaning perfectly clear from the situational context (Linda vigorously shakes her head, pushes her food away, turns her back on the adult offering to help remove a doll's sock), for some three weeks before the full form suddenly appeared (1;8).

With regard to the remaining syllables in long words, in the earliest stages second and last syllables were almost equally likely to be omitted. By 1;9 the last syllable was much more often dropped, even though it generally receives secondary stress in adult trisyllabic forms. Looking more closely at the data, however, it should be noted that five out of the six words thus simplified at 1;9 ended in /ne/, an open, maximally "light" syllable in physical terms, and functionally a non-productive derivational suffix most often found on adjectives, in particular on the color terms, which Linda learned (with much coaxing) as a set and still fails to differentiate.

Though the second syllable was omitted in ten forms according to the summary in Table 2, only four words are involved: /kírjut·à/ 'write' → [kil·a] (1;7 - 1;10, i.e. 4 forms), /pát·arèi/ 'battery' → [pát·í] (1;8), /mérilìn/ 'Marilyn' → [míl·i] (1;8 - 1;10), and /kángarù/ 'kangaroo' → [káɣu] (1;9 - 1;10). The difficulty in making any percentual or statistical remarks about the child's rendering of adult form is obvious: The first time Linda used, e.g., [míl·i], roughly a month after first hearing, and then being regularly exposed to, the cumbersome name /mérilìn/, with its difficult /r/ and /l/ in close proximity, we could infer a relationship between the (adult) form heard and the form produced; on subsequent uses, however, no such relationship need obtain. With words the child uses often, at least, she is surely no longer attending to the adult form before producing the word anew, but is simply consulting her own lexicon -- however that may be stored.[7] And yet this analysis is overly static: Though such words as [kil·a] and [mil·i], which Linda uses constantly, retain a relatively primitive phonetic shape even into a stage where a much closer approximation of the adult form might be expected, still the child will eventually change the shape of these items. Clearly at some point she must attend to the adult form afresh, or she would never note the discrepancy between that and her own version. The problem is of course complicated where, as in the

case of the name [míl·i], the adults adopt the child's term! A better example here is thus [kil·a], which Linda has used consistently and with very high frequency for at least six months (i.e., since the beginning of this investigation), in spite of regular dialogues in which the full inflected forms /kírjut·à/ (s2imper.), /kírjut·àp/ (s3pres.), /kírjutàta/ (inf.), and others occur repeatedly.

Whether or not the second syllable is dropped does not appear to depend on the particular vowel nucleus of the second and third syllables. We find /u/ replaced by [a] in [kíl·a], /a/ by [i] in [pát·i], and /a/ by [u] in [káɣu]. (I class [núhi] for /róhelîne/ 'green', in which [i] may as easily derive from the second syllable /e/ as from the third syllable /i/, as "last syllables omitted"; even if it were taken as an additional case of "second syllable omitted", it would merely represent loss of a like vowel, [i] for /iCi/. Rather, the surrounding consonants provide the explanation: The second syllable vowel is never lost when it is both preceded and followed by obstruents -- cf. [mú·si] (1;7), [músik·à] (1;8), [mú·sikà] (1;9) for /mú·sik·à/ 'music' and even [ápik·ù] (1;7 - 1;8) for /àp·rik·ó:s/ 'apricot' (and, for Linda, 'orange' as well), in which the post-consonantal /r/ is either "not heard" or treated as part of the nucleus, presumably because a solidly perceivable and reproducible stop precedes it. In all the cases in which the second syllable vowel is lost, that vowel is either preceded or followed by /r/, the most difficult of consonants for Linda. The cluster /rj/ obviously "counts" as /r/, both in /kírjut·à/ → [kíl·a] and in Linda's first attempt at /káe:lkîrjak·/, produced directly on hearing the adult label for a picture in her circus book: [káljakàm], an intriguing combination of metathesis (which otherwise occurs in her lexicon only in [átup·àk·] for /ák·ropàt·/ 'acrobat' (1;10), [páti] for /lápitas/ 'shovel' (used once only, [kít·] for /tek:/ (from 1;7 on), [másа] for /lám·as/ (1;7 only, corrected to [lám·as] by 1;8), and [ója] for /jú:a/ (1;7, corrected to [jú:a] by 1;8), and vowel-copying, or assimilation, from one syllable to another.

Quantity

Simple length -- short vs. non-short -- appears to pose no particular problem in consonants. The error quotient for all medial obstruents, taking into account only variants "correct" along every dimension except quantity, is only 25% at 1;7, and drops steadily through the three following months: 19% at 1;8, 16% at 1;9, and 13% at 1;10. The corresponding error quotient for nasals and /l/ is negligible. In vowels, the number of short vowels reproduced as long is insignificant (the highest figure being 25% for /e/ at 1;7, down to 11% by 1;10, with no errors in length recorded for /a, ä, o, or ö/). There is more of a tendency to

fail to render the long vowels as long, with some error for all vowels (except /ü:/, reproduced only in one form, [í:a] for /hü:a/ 'to call out, shout'), ranging from 100% for /ö:/ (reproduced once in each month of field sessions, from 1;8 to 1;10) to none by 1;9 for /e:/ and /u:/.[8] The total number of forms involved is very small, however, so that the only conclusions possible would seem to be that (a) correct reproduction of length is more difficult in vowels than in consonants and (b) long vowels are more likely to be perceived, or at least reproduced, as short than vice-versa.

Correct perception and production of the difference between long and overlong segments or syllables is a further crucial task in the acquisition of Estonian phonology. Already at 1;7 and 1;8 a number of overlong forms appeared to be correctly reproduced, but in the absence of a record on tape the actual fidelity of the child's reproduction can not be ascertained. One form, /jú:stu/, used for the first time during a field work session at 1;7, was practiced over and over as Linda made a distinct effort to reproduce it correctly. As is the general rule in her imitations, the first effort was the most accurate -- [jú:ʔhu], followed by [tút:u], [úh:u], and [jút:u] (twice). At the next session a week later she varied between [jú:htu] and [júh:u], the latter with a distinct pause -- as if for a glottal stop -- in the middle of the long [h:], so that [júhʔhu] might be a more accurate rendition. At 1;8 she was still dissatisfied with her own version of the word, varying the pronunciations [jú:s'u], [jú:hʔsu], [jú:tsu] and [júh:tu]. It is likely that, aside from the /st/ cluster, which still gives her some trouble in other forms as well, the chief goal of all these variations on the same word was reproduction of the extra length in the first syllable, as Linda tried lengthening now the medial consonant or cluster, now the vowel. In fact the vowel is long and the /s/ is long as well, this being one of the cases in which assignment of segmental length involves an arbitrary decision.

To determine just how closely the length of the child's forms approximates the adult norms would require instrumental analysis, but aside from subjective judgments regarding absolute length, which are liable to be unreliable, close attention to tape recordings allows the child's performance to be rated for two important additional cues to the contrast, length of the second syllable vowel and intonation. At 1;9 a number of forms could be unmistakably categorized as long or as overlong:

Long			Overlong		
[pí·ats]	for	/plí·ats/	[kó:k·i]		
[pé·pi]			[mő:s'i]		
[jó·pi]		/ró·pi/	[kúk:i]	for	/sók:i/
[lú·li]		/lú·le/	[kái:k·i]		/kát':ki/
[páp·u]			[nót':s'u]		
[múk·i]			[mák:hi]		/mắh:kmet/
[át·u]			[júh:tu]		
[ís·u]		/ístu/	[jáh:ti]		/láh:ti/
[kák·u]		/ʃánk·u/			
[kíl·a]		/kírjut·a/			
[míl·i]		/mérilin/			
[án·a]					

Table 3

Though there is no long /l·/ in the adult model for [kíl·a] and [míl·i], Linda's relatively consistent use of the long, not short or overlong, degree in these words shows that a certain amount of control over length as a variable has been achieved. Alongside the correct forms above we find errors such as [túp·a·] for /túp:a/ -- the second syllable vowel distinctly 'long', giving the impression of a long rather than overlong first syllable; [út·a], [ó·t·a] for /ó:t·a/ -- the obstruent long, the first syllable vowel long but not as long as expected in an overlong syllable; [vák·a] and [úp·aʃ for /vák:a/, /hűp:a/; and [kól:a·] for /kól·anè/, with the second syllable as long as would be expected in a form with a short first syllable and the medial sonorant in the third degree of length. In general, exaggerated lengthening of the second syllable after a long or overlong syllable was a frequent error. In monosyllables the third degree of length was generally found as expected -- [kó:k·], [fűk:s], but e.g. [jó:k̯], with a short, near-voiced final consonant, for /jó:k·/.

Linda's intonation patterns were also exaggerated at 1;9, but she was clearly able, in a majority of forms, to associate a rising pitch with long syllables, a rising/falling contour with the extra long, even in monosyllables such as /kó:k·/ (cf. Liiv 1960:488). In view of the well-known fact that children acquire intonation patterns relatively earlier than other linguistic distinctions, it is not surprising that Linda should be well on her way to mastery of the long/overlong contrast by 1;9. By 1;12 she shows less of a tendency to exaggerate the length of the unstressed syllables, and makes even more impressive use of the rising/falling pitch on overlong syllables (never on the short or long), notably on her recently acquired lexical item /sá:p·at/ 'boots'.

Phonological processes

Up to now we have looked at the general outlines of Linda's substitution patterns, taking up each consonant and vowel position separately and not attempting to describe Linda's structures at the four stages as integral wholes. While I do not propose to begin postulating a series of grammars at this point, by taking a closer look at the particular choice of substitutes made, in the context of the whole words involved, in initial consonants, the area which showed the greatest change over the four months examined, we may be able to gain a clue as to what organizing principle(s) may be at work as Linda deals with the task of recognizing and, in particular, reproducing parts of her linguistic environment.

To begin with the stops, the only words showing variations or errors in the replication of /p/ are

	1;7	1;8	1;9	1;10
/pɔ̃l:(e)/	bɔ̃l:	ɔ̃l':		pól:i
/pɪnkví:n/				pínku, vínku
/pʊ̃ksit/	pʊ̃t'si	bútsi, pús·it	píksi	pʊ̃tsi, vítsi

-- the first and third form containing a "difficult" vowel, one Linda is still in the process of mastering, while the second includes a difficult medial cluster, probably the source for initial [v] in the variant [vínku] as well as for the unstressed vowel in both variants.

For /# t/, the two errors are represented by:

/tɪ̃·ví:/	ví·vi, pí·bi, pí·vi	bí·bi, tí·vi		tí·vi
/tek:/	kit:	kit:	kit:	kit:

In both these forms the second consonant is interfering with the first, i.e. the consonant in the more "stable" position is interfering with that in the less stable position. In the second form cited the metathesis of [t] and [k] may well be reinforced, or partially induced, by alliteration with its usual modifier in Linda's language, /kàli-kál:i/, an affectionate baby-talk term meaning, roughly, 'cuddle-cuddle'. The phrase [káli kɪ̃t:] 'cuddle blanket' persists in Linda's language today (at 1;12).

For /# k/, errors occur in

/kí·kup/	pí·ku, kí·ku	kí·ku	kí·ku	kí·ku
/kín:i/	gín:i, ín:i, kín:i	kín:i	kín:i	kín:i
/kírjut·àp/	kíl·a, jíl·a íl·a, híl·a	kíl·a	kíl·a	kíl·a
/kómp:vek·, kómp·u/	póp·u, kíp·u, kóp:u, kómp·u	kúmp·u, kómp·u		
/kõr:v/	kõɬ:, tuɬ:	kõɬ:		kul:

The errors in reproducing initial /k/ are all ephemeral, none persisting beyond 1;7. Here again the fourth and perhaps the first example show the influence of a consonant later in the word -- though the initial [p] in [pí·ku] is better explained, if at all, as a dissimilation from medial [k] than as an assimilation to the final short [p], which Linda came to pronounce (in any word) only some five months later.

Turning to /# s/, with its high error quotient, we may as well look at the data in full.

/sápa/	pápa	mápa, nápas		
/sái:a/			sáia	sáia
/séta/			séta	séta
/se:/				se:
/séisa/		ísa		
/sél':ka/				lél·ka
/sí:a/			sí:a	sí:a
/sí·n/				si:n
/sínti/	línti, línti	nínt·i, nínti, línti	sínti	
/síninè/				níni(ă)
/sók:i/	kúk:i, gúki, úki	kúk:i	kúk:i	kúk:i
/sus':, sús:i/	(s)us:, uf:	uf:, us:, jos:	sús·i	sús·i
/su:r/				ju:
/sö:p/				su
/sűl:e/	túja	túja	túl:a	

Table 4

The source of the initial consonant substitute seems clearly to be the post-vocalic consonant, with zero in case that consonant is again /s/ (/séisa, sus:/). The initial [t] in /sʉ̈l:e/ constitutes a unique example, so that we cannot determine in detail the respective contributions, in terms of perceptual or motor analogy, of the medial /l/ or the vowel /ʉ̈/. A lone example of /š/, produced after much prompting by the mother, again shows the significance of the post-vocalic consonant in suggesting a substitute for a troublesome initial: /šlei:f/ yields (1;8) [vef:].

The data on the sonorants /l/, /r/, and /j/ in initial position also deserve quoting in full. (The nasals are produced almost without error from 1;7 on, and are thus of little interest here.)

/lápitàs/	páti			
/láh:ti/	jáhti	jáhti	jáhti	jáhti
/lám·as/	másа		lám·as	
/lámp:, lámp:i/	mámpi, mám·pi, lam·p	mam·p		lam·p
/láulap/		lál·au	láulau	
/léi:pa/				vé:pa
/líplik·às/		vé·pik·às	líplik·às	
/líha/	íha			
/lil:/	il:	líl:	líl:, jil:	
/líl·a/			wil·a	lil·a
/lin:t/	in·t, nin·t	nin·t	nin·t	nin·t
/línta/	ínta, nínta	nínta, línta	nínta, línta	nínta
/lip:/		vip:		vip:
/(ej#) lúpa/			júp·a	
/lúmi/	lúmi, məni, númi	númi		
/lúsikàs/			lúsikì, lúsikà	lúsikà
/lú·le/		lú·li	lú·li, ju·li	lú·li
/lővi/			júvi, núvi	júvi
/lína/	nína	nína	lína	
/rá:tio/	ájo, áju	áju	áju	áju
/ráha/		jáha	jáha	jáha
/rát·as/	át·a	át·a(s)	át·as	
/ró·pi/			jó·pi	
/róhelìne/		núhi		
/ron:k(i)/				nón·gi nun·g
/rónip/				núni
/rút:u/				jút:u
/rőnkas/				nőŋg, núŋg

Table 5

Here again, until [l] begins to be used, we have zero initially for /r/ or /l/ where the post-vocalic consonant provides no reproducible model (lil:, líha/), initial nasal from post-vocalic nasal (/lam·as, lamp:, lin:t, línta, lúmi, lína, rón:ki, rónip, rőnkas/, and perhaps even /róhelîne/, though the /n/ of the adjective suffix was first used only once at 1;12. In the remaining cases we find (1) [v] where post-vocalic /p/ occurs in the model (léi:pa, líplikàs/ -- suggesting a decision to combine the feature 'labial', copied from medial /p/, with the feature 'continuant', echoing the replaced sugement /r/, given the availability of a viable segment [v] bearing just this blend of features -- and (2), as a kind of last resort, [j], where neither /i/ nor /j/ follows closely (/ráha, rút:u, láh:ti/ vs. /rá:tio, líha/). A few further examples of the influence of the post-vocalic consonant are provided by the data on jod, though the semivowel shows the least variation of the non-nasal sonorants.

/ja(h):/	ja:, jah:	ja:		
/ják:i/				ják·i
/jal:k, jálat/	al:, ála	ála, al':, alk	ála	
/jál:ka/			lál·ka	lál·(k)a
/já:na+lîn·t/			já:janînt	já:janîn:
/játkup/				játki
/júk·u/	kúk·u		júk·u	júk·u
/jó:k·(i)/			jo:k·	jó:k·i
/júhip/	júhu, úhu	júhu		
/júh:tup/			júh·tu	
/jú:a, jo:p/	ója, ju:	jú:a, ju:	jú:a, ju:	jú:a
/jú:kset/		jűtsi		
/jú:stu/	jú?hu, tút:u, ůh:u, jút:u, juhtu	jú:s'u, júhsu		
/jǻnk·u/	kák·o, kák·u	kák·u	kák·u	
/jǻ:t·is/		jási, jǻsi	sǻsint	sǻs:i
/jűri/			jú·li	
/jǻ:p/				jǻ:

Table 6

Clearly Linda is operating with a tentative consonant assimilation rule which copies a post-vocalic consonant initially just in case the initial consonant is not a stop (oral or nasal). This "rule" is optional at all stages, and loses force steadily as the various consonantal articulations are masterd. It thus constitutes, in effect, more of an operational principle or strategy for dealing with difficult initial

consonants than a "productive rule" in the sense of adult grammars, and it would have to include some further constraint relating to the perceptual salience, or, in Waterson's terms, the strength of articulation -- insofar as either of these can be judged -- of the medial (adult) consonant, to account for the fact that nasals are by far the most "contagious" post-vocalic entity.

Recalling that Linda also has a tendency to copy a stressed vowel into the unstressed vowel position in disyllables, moreover, it begins to seem that the consonantal assimilation is part of a larger principle -- a kind of preference for reduplicating, alliterating, or assonating syllables -- a preference clearly evident as well in the child's forms reported in Waterson 1971, where of 15 forms, eight are fully reduplicative, three are alliterating, one is assonating, and only three show none of these patterns. This same preference, in fact, would account for Linda's wholly non-functional use, three times in the course of the second two-hour session and frequently on earlier occasions, according to her mother's report, of one of her first two-word collocations, [kála· úju·] 'fish swims', apparently uttered purely for purposes of aesthetic indulgence. The high number of reduplicating words in Estonian as well as English baby-talk undoubtedly reflects children's attachment to the form -- as a residue from the babbling, syllable-repeating stage?

MORPHOLOGY AND LEXICON

In the phonological discussion above I concentrated on substitution analysis, taking the adult form as a model of the child's intention, though without necessarily concluding that the adult form is an "underlying form" in the child's grammar: We do not know what the child actually perceives -- and I have made no tests to determine whether Linda would note the error if I imitated her in merging /kleit:/ 'dress', /tek:/ 'blanket', and /kit:/ 'chain' in [kit:], for example, so I must consider the shape of any "base forms" Linda's grammar may contain a moot point, at least until it can be established that (some of?) the phonologically alternating inflected forms in her lexicon are perceived as semantically unified entities.[9] In turning to morphology, for the briefest of sketches of Linda's achievements in this area, I have essentially proceeded in the same manner, keeping conservatively close to the concrete evidence in interpreting the productivity of the inflections she seems to be using. Like Bloom 1970, I have tried to use the linguistic and situational context to understand the meaning of what Linda says, though her meaning is by no means always tied to the immediate environment, nor is the boundary between repetition of

forms for pleasure and phonetic practice and their meaningful use always clear. Thus, alongside the example of Linda's early "sentence" [kála· úju·], given above, notice these ambiguous instances: (1) Linda repeats the word /kõva/ 'loud' to herself after hearing me wonder to her mother whether the tape-recorder has been on loud enough; a week later, as I begin to prepare the machine for recording, she uses the word again -- though it had not surfaced in the interim. The "meaning" of the word for her at this point remains obscure. (2) As her mother converses with a friend who uses the expression /èi: tóhi/ 'mustn't' several times, Linda begins practicing it. Later, whenever her mother mentions the friend's name, Linda volunteers /èi: tóhi. Some time later she begins to use the term in what appear to be appropriate contexts -- but the proper "meaning" of the term seems clearly to have lagged behind its phonetic form in taking its place in Linda's emerging lexicon.

I append here, citing only the shapes of the adult model words, Linda's active vocabulary (as testified in field work sessions) as of November 1971 (1;11), omitting only words directly mimicked on hearing an adult and not repeated later, and including inflected forms wherever Linda has produced a recognizable corresponding inflection, whether or not regularized or otherwise distorted (see Appendix). To summarize the results of a very preliminary syntactic and morphological analysis, the categories into which I have tentatively divided Linda's lexicon are:

(a) common nouns -- total so far: ca. 140. This includes only nouns other than names, used holophrastically or as possessor-possessed, subject or object of a sentence, or in the comitative ('with') case.

(b) proper nouns -- 16. Names of persons and dogs only so far; only one has received any inflection.

(c) pronouns -- 3. I include as a pronoun /íse/ '[my]self', though it is syntactically unique in that it typically occurs after the verb in the adult sentence, reinforcing the noun or pronoun subject, which normally precedes the verb. It occurs only in the nominative (Linda has not yet used its suppletive oblique forms, on the base /enta/), and is uninflected for person or number. In Linda's sentences it generally occurs as a reinforcer for her own name, [nínta ísi] 'Linda [her]-self', but it also follows the verb in [té:n ísi] 'I-do[-it] [my]self'. It thus fails to pattern with either of Linda's other pronouns, /se:/ 'it', which occurs in the nominative singular in the normal subject-verb order, and /ómat/ 'own-ones', which occurs only in possessor-possessed constructions: [táti ómat] 'auntie's own-ones'. /íse/, which was present already at 1;7, could in theory substitute for all the missing personal pronouns ('(mother)[her]self does it', etc.), but actually had been used only for the first person singular through 1;11. The fact that it is often sentence-

final -- or at least post-verbal -- in adult Estonian, and thus, according to Slobin (1972), more salient to the child, may well explain why it occurred so much earlier than any of the other pronouns, though it also has the advantage of not changing, as the deictic personal pronouns do, with a change in interlocutor: Linda may hear 'Can you do it [your]self?' and respond with the same term, '[My]self'.

(d) adjectives -- 19. No inflection so far (with the possible exception of one occurrence of /ú· et/ 'new, pN'), though Estonian adjectives take, potentially, all the cases found on nouns and must obligatorily agree in number with the noun modified.

(e) numerals -- 5.

(f) verbs -- 47. I include the copula, though it only occurs so far as an emphatic, with the affixed particle /+ki/, as part of the interjectional remarks /ón:ki tűhi/ 'is indeed empty' or, in the sense Linda hears most, 'there we are, it's empty now', and /ón:ki otsas/ 'is indeed at-an-end', i.e. 'all-gone'. Linda appears to use these phrases interchangeably, on closing a book she is no longer interested in, for example.

(g) reduplicatives -- 12. These words are not inflectable and are ambiguously nouns or verbs, depending on context: cf. English tickle-tickle or wee-wee. The one lexical item which is entirely Linda's own creation, [(nə̀n':)nə́n':(i)] 'eat, food', is also listed here. Though it departs formally from the other reduplicatives in having, in some instances, a final vowel, it shares their stress pattern and it also shares their morphological traits, as described above. At 1;12, however, Linda used an infinitive marker on this form, thus setting it apart from the rest of this set.

(h) adverbs -- 25. I include all nouns inflected for locative case, or used in a clearly locative function without inflection.[10] Specifically, 19 of the "adverbs" are nouns used as locatives, of which 16 are specifically marked for locative case, while 3 lack the expected case marking but are clearly intended as locatives: [nínta ka póp·u ké:mi] for /...póp·u péale kré:mi/ 'Linda too [gets] cream [onto (her)] bottom', as her mother applies ointment; [jǎ:t·ist pínki] for /jǎ:t·ist pínki péa:l/ '[we ate] ice-cream [on (the)] bench'; [múlu kúk· i pə̀l':i] for /múrul.../ or /múru pea:l/ '[I'll do a] somersault [on (the)] grass'.[11] Of the 16 nouns marked for locative case, five also occur in "grammatical" cases, i.e., nominative or partitive, while the remaining 11 are true "adverbs" in Linda's lexicon in that they do not as yet function as regular nouns, occurring as subject or object of a sentence, etc. Of the 7 nouns used in the comitative, on the other hand, none fail to occur in either the nominative or the partitive as well. Two further instances of nouns unmarked for case but used in a function where a "locative" case marker would be expected in adult

Estonian are [víska míl·i] for /...míl·ile/ 'throw [to] Marilyn', while rolling a ball, and [áua kàl·i-kál·i] for /aúale.../ '[to the] bow-wow hug-hug'. I do not include these instances under the category "adverb", since the missing case marker is here functionally a dative, though formally it is identical with the allative or 'onto, toward' case. This suffix was actually used for the first time at 1;12: [ma ká: púhu líntalè] 'mother also blow [on food, to cool it] for Linda'.

Before presenting the lexicon I review briefly the order of Linda's acquisition of inflectional markers and morphophonemic alternants through 1;11.

The regular third person singular past tense marker, /s/, is used for the first time at 1;8, on verbs ([ó:t·ais] for /ó:t·as/ 'waited', [ós':tís] 'bought', [kúk:us] 'fell', [láu:laus] for /láu:lis/ 'sang'), but with no particular contextual motivation for past tense use in some instances, and even on nouns: [át·ais] for [át·as], the form she had been using before and has used since for /rát:as/ 'wheel, tricycle'; [tómais] for /tómat·/ 'tomato', [pátjais] for /páti/ or /pát:ja/ 'pillow, sN or sP'. In other words, she appears at this point to have noticed the marker and is eager to begin using it, but she is not yet certain how it is supposed to function (compare her acquisition pattern for /èj tóhi/ 'mustn't', described above). By 1;9 the past tense inflection is established and is used only in appropriate contexts. It continues to have the form [is] for /s/ in some cases: cf. [vá:t·ais] for /vá:t·as/ 'watched'; [kíl·ais] for /kírjut·as/ 'wrote' (with Linda's own present tense form [kíl·a] as a base); [ju:s] for (irregular) /jõi:/ 'drank'. The inflection is clearly productive at this point.

The only noun case which appears to be used productively by 1;9 is the comitative or 'with'-case, marked /ka/, also first heard at 1;8: [hópukà] '[ride] with-horse' (the verb /sõi:t·a/ 'ride' governs this case) and [jálakà] 'with [the] foot'. By 1;9 she still used this inflection on very few nouns, but could answer the question /míl·e+kà sa mãnkit/ 'what are you playing with?' with an inflected form: [õhup·àl·ikà] 'with-balloon'.

With regard to the locative cases used on nouns, it is difficult to decide whether they are productive or not. The illative case is often formed by lengthening the first syllable of the base -- which may be more or less phonologically distant from the surface forms: cf. /túpa, túp:a/ 'room, sN, sIl.', but /vésí, vét:e/ 'water, sN, sIl.', base */vete/. Linda has not so far formed any irregular illatives -- and indeed it is difficult to imagine what form such an irregular creation could take. The inessive, marked /s/ like the preterite, is more easily generalizable,

but has also not been irregularly used so far. Both the illative and inessive were first used, like the comitative, on the stem */jalka/ 'foot', at 1;8. By 1;9 Linda responded to a /kus:/ 'where' question appropriately, with /kás't'is/ 'in (the) large box'. These inflections have been used on relatively few bases so far, but, as mentioned above, those few bases often occur only in a locative use, so that there is no way of knowing whether Linda perceives the form as "a kind of noun" or not -- cf. /túp:a/ 'lit. into the room', used to mean 'to indoors' in the only sense Linda knows. To give an idea of the order of development of these affixes I have marked the date of first use for each noun with a locative marker (see Appendix).

By 1;10 the nominative plural /t/ occurs commonly. Linda's first expression of the marker was at 1;8, on the word /pűks'it/ 'pants', which occurs only in the plural, as in English. At 1;9 she used (appropriately) the expression /tät'i ómat/ 'auntie's ones', suggesting understanding of the plural function. Adjectives continue to be unmarked for plural: cf. 1;10 [ví̋k·i áv·it] 'little monkeys' for /vä̋i:kset áhvit/ (singular /vä̋ike áh:v/).

At 1;10 also we have a sudden flourishing of the partive singular marker /t·/, one of the variants used to indicate this case in the adult language. In the holophrastic stage Linda had used nouns alternately in the nominative or in the partitive singular, in the less easily detached variant, lengthening of the first syllable (as in the illative) -- cf. /pal':, pál':i/ 'ball, sN, sP' -- and her earliest two-word utterances (1;7) included verb-object as well as subject-verb collocations. Since then, some nouns appeared correctly in the partitive singular in the object slot, taking the partitive to be the general object marker for present purposes. But only at 1;10 did an overt marker come to be used productively, the /t·/ occurring even on forms not normally so marked in the adult language: e.g., [kúf·it·] for /kóh:vi/ or /kóh:fi/ 'coffee, sP'). By 1;11 the marker was used, in a striking invention, on the irregular partitive /seta/ 'this' (nominative /se:/): [setat·].

Still incompletely analyzed data from 1;11 show the sudden appearance of the third person singular present tense inflection, /p/, even on forms which had earlier been interpreted as imperatives (unmarked in the second person singular in the adult language), suggesting that it is over-analyzing to define an indicative vs. imperative mode contrast in the child's linguistic expression at this point (though she may well know the difference between an order and a statement or description -- without perhaps yet intending to express the distinction in speech?)

NOTES

[1] Judging both from Linda's performance and from that described in Waterson 1971 (English at the 18-19 month-old stage) as opposed to the three corpuses sketched in Moskowitz 1970 ("The two-year-old stage..."), this is commonly the period of fastest phonological change. At the beginning of this period the child's utterances are interpretable only by the mother or others in constant attendance on the child, who have learned, from observation of use in context, what he or she means. By the age of two the child commands almost the complete adult inventory of sounds and can often be understood by an adult of good will. The longer mean utterance length at this stage aids understanding by adults as well, of course.

[2] No tape-recordings were made through the first two months of field work. When, as of the third month, the tape-recorder began to be used regularly, it was found to be of doubtful help in making certain difficult phonetic interpretations ([ʉ] vs. [i], [t] vs. [k], etc.), but it proved invaluable in examining the evidence with regard to quantity. It is of course also necessary for retrieving the (adult) linguistic context of Linda's utterances, for later syntactic and semantic analysis.

[3] The following abbreviations will be used in glosses: s = singular, p = plural; N = nominative case, G = genitive, P = partitive, Il. = illative, In. = inessive, Com. = comitative; Tr. = translative, pres. = present tense, pret. = preterite; imper. = imperative, inf. = infinitive; and s2, s3 = second, third person singular. Case will not be specified in glosses for nouns in the nominative singular, the morphologically unmarked case.

[4] For fuller information regarding the context of the particular substitutions made, see Phonological processes below.

[5] The data on the palatal series of consonants (medially and finally) requires additional study. For the purposes of the present report alveolar and palatal consonants will not be treated separately.

[6] This sound, transcribed Ψ, is described in Ariste 1935 as "a bilabial voiced vibrant accompanied by faint vibration of the tip of the tongue. There is a double stop at the beginning of the sound: a bilabial stop at the beginning of the sound: a bilabial stop along with a linguo-dental or linguo-alveolar one. The stop is voiceless, the rest of the sound being voiced."

[7] That Linda at 1;9 was already definitely monitoring her own speech is well documented by two pieces of self-editing captured on tape: (1) She tries to say /núk·u nút·up/ 'dolly cries', but the fine ordering of oral/nasal and alveolar/velar articulatory commands apparently has a 'tongue-twister' effect on her and she interrupts herself twice: [núk·u tút· - nút·u nút· - núk·u tút· -], never quite managing the sequence she clearly intended. (2) Hearing Muki bark outdoors she begins as a reflex to comment [tǻti míl·i], i.e. interpreting his bark as a reaction to my arrival, but then catches herself, as I am in fact already present, and revises the utterance to name another family friend: [tǻti mi- íinga].

[8] The long [õ:] has not yet occurred in Linda's vocabulary. Though it is certainly present in adult Estonian -- cf. /rõ:m/ 'joy', /võ·ras/ 'strange, foreign', /sõ:m/ 'draught, gulp', /rõ:sk/ 'fresh (cream)' -- it may not have happened to be used in the language Linda has been exposed to so far.

[9] Ingram 1970 takes a diametrically opposed position, suggesting that underlying forms be posited on the basis of what the child appears to understand as well as what he produces. The establishment of rules to deal with morphologically related variants would constitute, in either view, an entirely different level of structure, one which in Ingram's model, would be superimposed on a more primitive level, which will eventually have to be discarded.

[10] The basic Estonian locative cases include an "inner" or "close contact" set -- illative 'into', inessive 'in', and elative 'out of' (also used with body parts where English prefers on/off: put a shoe into-foot, wear a hat in-head, etc.), and an "outer" set -- allative 'onto, toward', adessive 'at', ablative 'off of, away from'. In addition there is the less often used terminative 'as far as'; the state of being cases, essive 'in one's capacity as' and translative 'into the state'; the comitative signifying 'with' in both the instrumental and accompaniment sense; and the abessive 'without'. Besides the nominative, the case most commonly used for the subject of a sentence, and partitive, generally used to mark the "partial" object, there is a genititive case, which marks the "total" object in some instances in the singular (the nominative takes on this function in the plural and under some conditions in the singular, such as after a verb in the imperative) as well as marking the possessor. Both the partitive and the genitive case may also govern a large assortment of postpositions and a few prepositions; at 1;11 Linda had not used any of these yet. Note that Linda has so far acquired none of the cases involving a negative term in their semantic made-up -- out of, away from, without.

[11] All of these "locative" nouns may in fact be taken to be in the genitive case, which generally governs postposition. Since the genitive singular is very often homophonous with the nominative and sometimes even with the partitive singular, it is even more difficult than usual to determine at what point Linda begins to make productive use of this case. It will not be discussed further here.

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APPENDIX

Linda's lexicon as of 1;11

(a) Common nouns

ah:v	'monkey'
áh:vi, áhvit	'sP, pN'
ák·en	'window'
ák·ropà:t'	'acrobat'
á·pits~à·pé:	'book'
à·pé:t	'pN'
áp·rik·ò:s'	'apricot, orange'
árs:ti	'doctor, sP'
áua	'bow-wow'
auk:	'hole'
áut·o	'cat'
áut·okà	'sCom.'
élevànt:	'elephant'
éma~ma:	'mother'
hápe	'beard'
hári	'brush'
hélik·òp:ter	'helicopter'
hi:r	'mouse'
hópu(ñe)~pr:(u)a	'horse'
hópukà	'sCom.'
hun't:	'wolf'
jak:	'jacket, cardigan sweater'
ják·i	'sG'
jal:k	'foot, leg'
jálat, jál:ka, jálas, jálakà	'pN, sP/sIl, sIn, sCom.'
já·nalîn:t	'ostrich'
jo:k·	'drink'
jó·ki, jó:k·i	'sG, sP'
jú:kset	'hair, pN'
jú:stu	'cheese, sP'
jǽn'k·u	'bunny'
jǽ:t·is	'ice cream'
jǽ:t·ist	'sP'
káe:l kîrjak·	'giraffe'
káh:vel	'fork'
kák·a (nun·ut)	'caca (turds)'
kála	'fish'
kám:i	'comb, sP'
kámp:sun~kámp:s'i	'sweater'
kána	'hen, chicken'
kán:karù	'kangaroo'
káru	'bear'
kas':t	'box'
kás':ti, kás'tis	'sP/sIl, sIn'
kel:	'watch, clock, time (of day)'
ket':	'(dog, watch) chain'
kí·su	'kitty'
kí·sut·	'sP'
kit:s	'goat'
klau:n	'clown'
kleit:	'dress'
kóh:vi	'coffee, sP'
kómp:vek·~kómp·u	'candy'
kómp·ut·	'sP'

kon:	'fog'
kon't':	'bone'
kón't':i	'sP'
ko:k'	'cake'
kó:k'i	'sP'
ko:r	'(orange) peel'
kóp'ik'às	'penny, kopeck'
kot':	'purse, bag, suitcase'
kótu	'house, home'
kra:ń	'faucet'
kré:mi	'cream, sP'
kruvi	'screw'
kuk:	'rooster'
kúk'erpàl':	'somersault'
kúk'erpàl':i	'sP'
kõr:v	'ear'
kárpes	'fly'
kät:	'hand, sP'
käe:s	'sIn.'
kátsup'	'ketchup'
lám'as	'lamb'
lamp:	'lamp'
lámp:i	'sP'
lápitàs	'shovel'
léi:pa	'(dark) bread, sP'
líplik'às	'butterfly'
líha	'meat'
lil:	'flower'
lin:t	'bird'
lín'ut, lín:tu	'pN, sP'
lip:	'flag'
lúmi	'snow'
lúsik'as	'spoon'
lúsik'aka	'sCom.'
ſõvi	'lion'
máh:la	'juice, sP'
mám'u	'fruit, berry, sP'
mám'ut	'pN'
mém:e	'grandmother, sP'
mó:s'i	'jam, sP'
mú'a	'moo-cow'
múna	'egg'
mú'sik'à	'music'
mäh:kmet	'diaper, pN'
mütt':s'	'hat'
nápa	'navel'
[néli]nùrk:	'square'
nína	'nose'
nót's'u	'piggy'
núk'u	'doll'
nö:p'	'button'
ónu	'uncle'
órav	'squirrel'
pal':	'ball'
pál':i	'sP'
paná:n'	'banana'
páper	'paper'
páp'u	'shoe'
páp'ut	'pN'
part:	'duck'
pártit	'pN'
pá:t'-	'boat'
pá:t'ikà	'sCom.'
pát'arèi	'battery'
pát'i	'pillow'
pát':ja	'sP'

[pát'sa]lìna	'towel'
pé·pi	'baby'
pílt:i	'picture, sP'
pi:m	'milk'
pí:ma	'sP'
pinkví:n	'penguin'
plí·ats	'pen, pencil, crayon'
pli:t·	'stove'
plo:m	'plum'
príl̥t	'(eye) glasses, pN'
prít:si	'injection, sP'
pútel	'bottle'
pún'·u	'tummy'
pu:	'tree'
pus':	'bus'
põl:	'apron, bib'
pől:e	'sP'
pűksit	'pants, pN'
rá:tjo	'radio'
rá:tjot·	'sP'
ráha	'money'
rát·as	'whell, scooter, tricycle'
rát:akà	'sCom.'
ron:k	'train'
rőn:ki	'sP'
rőnkas	'ring'
sái:a	'white bread, sP'
sápa	'tail'
sók:i	'sock, sP'
sus':	'slipper'
súś':i	'sP'
sus':	'choo-choo'
s̆leif:	'bow'
tá·ta	'daddy'
tek:	'blanket'
tít·a	'child'
tì·ví:	'T.V.'
tómat'·	'tomato'
to:l'	'chair'
túĺi	'fire'
tut':	'tassel'
tár:n	'star'
tát̄i	'auntie'
uk:s	'door'
vánèma, vánaìsa	'grand-mother, grand-father'
várvas	'toe'
vár:pat	'pN'
vesi	'water'
ve:s, vet:, vét:e	'sIn., sP, sIl.'
vi:k·	'fig'
vó:t'i	'bed'
vó:t'i, vó:t'is	'sIl, sIn'
või:	'butter'
őh:tu	'evening'
őhupàl':	'balloon'
őhupàl'·ikà	'sCom.'
õu:n	'apple'
[ǿ:]kùl':	'owl'
kúl':i	'sP'

(b) Proper nouns

ant:s	'male name'	mérilìn~míl'i	'female name'
érna	'female name'	mó'nik'à	'female name'
é'ro	'male name'	múk'i	'dog's name'
ínka	'female name'	pámpi	'Bambi'
júk'u	'dog's name'	pát'i	'dog's name'
jűri	'male name'	ró'pi	'male name'
línta	'female name'	sínti	'female name'
lú'le	'female name'	tó'mas	'male name'
lú'let'	'sP'		

(c) Pronouns

íse	'(my)self'	se:	'this'
ómat	'own(ones), pN'	séta	'sP'

(d) Adjectives

áp'elsìn	'orange'	síninè	'blue'
hea:	'good'	su:r	'big'
kól'anè	'yellow'	téine	'other, second'
kő̈va	'loud'	túpli	'good (girl)'
kűl':m	'cold'	tűhi	'empty'
líl'a	'violet'	u:s	'new'
pak:s	'fat'	ú'et	'pN'
pálav	'hot'	vák:a	'quiet!'
púnanè	'red'	vál:ke	'white'
róhelìne	'green'	vä̋ik'e	'little'

(e) Numerals

uk:s	'one'	néli	'four'
kak:s	'two'	vi:s	'five'
kol:m	'three'		

(d) Verbs

aí:t·ap	'help, s3pres.'
ái:t·as	's3pret.'
án·ap	'give, s3pres.'
ástup	'step, s3pres.'
éhit·àta	'to build'
hŭ́p:ap	'jump, s3pres.'
ístup	'sit, s3pres.'
júhip	'drive, s3pres.'
júh:tup	'happen, s3pres.'
jú:a	'to drink'
jo:p, jõi:	's3pres., s3pret.'
jä̆:p	'stay, s3pres.'
kál:a	'pour, s2imper.'
kártap	'fear, s3pres.'
kátsup	'touch, try, s3pres.'
kí·kup	'rock, swing, s3pres.'
kí:k·us	's3pret.'
kírjut·ap	'write, s3pres.'
kírjut·às	's3pret.
ei: kísu	'not touch'
kúk·up	'fall, s3pres.'
kúk:us	's3pret.'
ei: kúk·u	'not fall'
kú:lat	'hear, s2pres.'
kṍń:ip	'walk, s3pres.'
láulap	'sing, s3pres.'
láu:lis	's3pret.'
ei: lúpa	'not allow'
mákap	'sleep, s3pres.'
mä̆́n'kip	'play, s3pres.'
nút·up~nút·ap	'cry, s3pres.'
nú·sut·àp	'sniff, inhale, s3pres.'
nä̆́i:t·as	'show, s3pret.'
ón:ki	'is indeed'
o:́t·a	'wait, s2imper.'
ó:t·as	's3pret.'
ós':tis	'buy, s3pret.'
óstap	's3pres.'
ót'sip	'look for, s3pres.'
púh:kap	'rest, s3pres.'
púhu	'blow, s2imper.'
púhus	's3pret.'
rónip	'climb, s3pres.'
séisap	'stand, s3pres.'
sö̆:p	'eat, s3pres.'
ei: táha	'not want'
tán't'sip	'dance, s3pres.'
te:p	'do, make, s3pres.'
ei: tóhi	'must not'
to:p	'bring, s3pres.'
túle	'come, s2imper.'
túlikì	's3pret. + indeed'
újup	'swim, s3pres.'
vá·tat·à	'to watch, look'
vá:t·ap	's3pres.'
vá:t·a	's2imper.'
vá:t·as	's3pret.'
vé̆:rep	'roll, intr., s3pres.'
vi:p	'take (away), s3pres.'
vís:kap	'throw, s3pres.'
vŏ̆t·ap	'take, s3pres.'
vŏ̆t':is	's3pret.'

(g) Reduplicatives

ài-ái:	'a hurt, a wound, pain'
alò·-aló:	'telephone'
àmp:s-ámp:s	'bite'
àt'·a-át'·a	'spanking'
kàl·i-kál·i	'hug, embrace, cuddle'
kòt'i-kót'i	'tickle
mùs'i-mús'i	'kiss'
(nàn':-nán':(i))	'eat, food'
pàt's'a-pát's'a	'bath'
pìs:-pís:	'wee-wee'
(tìŋ:-tíŋ:)	'toy, esp. musical instrument'
tùt'i-tút'i (~tút'ip~ tút'up)	'sleep' (s3pres)

(h) Adverbs

jál:ka	1;8	'foot, sIl.'
jálas	1;8	'sIn.
ká:sa	1;7	'along'
kás't'is	1;9	'box, sIn.'
kát':ki	1;8	'broken'
kín:i	1;7	'closed'
kó:l'i	1;9	'school, sIl'
ko:s	1;10	'together'
kúrk:u	1;10	'throat, sIl.'
kǽe:s	1;9	'hand, sIn'
láh:ti	1;7	'open, (cut) off, free'
ma:s	1;8	'ground, sIn.'
máha	1;8	'down (lit. ground, sIl.)'
múru	1;8	'lawn, sG (+postposition)'
ótsas	1;9	''finished, all-gone'
párk:i	1;7	'park, sIl.'
pínki	1;10	'bench, sG'
póp·u	1;10	'bottom, sG (body part)'
pót':i	1;7	'potty, sIl.'
púh:taks	1;8	'clean, sTr.'
pǽhe	1;7	'head, sIl.'
rút:u	1;9	'fast'
sél':ka	1;10	'back, sIl.' ([put] on, w. ref. to clothes)
sí:a	1;9	'here, sIl.'
si:n	1;10	'here, sIn.'
sǘl:e	1;7	'arms, lap, sIl.'
túp:a	1;8	'indoors, sIl.'
vál':mis	1;10	'ready, done'
ve:́s	1;7	'water, sIn.'
vét:e	1;8	'sIl.'
vó:t'i	1;10	'bed, sIl'
vó:t'is	1;9	'away, off'
ǽra	1;9	'away, off'

(i) Particles, interjections, etc.

ait·ắh:	'thank you!'
ei:	'no, not'
étasì	'onward, ahead'
hai:	'hi!'
íkːa	'still [more]' (emphatic)
ja(h):	'yes'
ka:	'also'
kík:i	'peek-a-boo'
ni:	'so, this way'
no(h):	'well, um, and now...?'
nðu-nóu:	'no (to dog only)'
nä(e):	'see, s2imper'
oi:	'oops! oh!'
ok·éi:	'o.k.'
pai:	'bye'
tére	'hello!'
veːl	'more, again'